Samsung Electronics MZ-V5P512BW

User Manual for Samsung 950 PRO Series 512GB NVMe M.2 SSD

Model: MZ-V5P512BW | Brand: Samsung Electronics

1. Product Overview

The Samsung 950 PRO Series 512GB PCIe NVMe M.2 Internal SSD (MZ-V5P512BW) represents the next generation of storage technology, delivering uncompromising power and performance. Equipped with the enhanced bandwidth of the NVMe interface, this SSD is engineered for intensive workloads, offering superior speed and efficiency. Its compact M.2 form factor makes it an ideal solution for consumer professionals utilizing high-end PCs and workstations, providing a significant upgrade in data processing capabilities.



Figure 1: Samsung 950 PRO Series 512GB NVMe M.2 SSD

2. Package Contents

Upon opening your Samsung 950 PRO Series SSD package, please verify that all the following items are included:

- NVMe M.2 (2280) SSD
- User Manual (this document)

Note: Other cables, screws, or brackets are not included and may need to be purchased separately depending on your system configuration.

3. Installation Guide

This section provides detailed instructions for installing your Samsung 950 PRO NVMe M.2 SSD. It is recommended to back up your data before proceeding with any hardware changes.

3.1. Pre-Installation Steps

1. **Download Drivers:** Before physical installation, download the latest Samsung NVMe driver from the official Samsung website (www.samsung.com/ssd). Save it to a USB drive or accessible location.
2. **Backup Data:** Create a full backup of your current boot drive. Tools like Acronis True Image or Samsung Data Migration software can be used for this purpose.
3. **Power Down:** Completely shut down your computer and disconnect all power cables.
4. **Open Case:** Open your computer case to access the motherboard.

3.2. Physical Installation

5. **Locate M.2 Slot:** Identify the M.2 slot on your motherboard. It is typically labeled 'M.2' or 'PCIe M.2'. If your motherboard does not have an M.2 slot, you may need a PCIe M.2 adapter card (not included).



Figure 2: Samsung 950 PRO SSD in an M.2 slot

6. **Insert SSD:** Gently insert the Samsung 950 PRO SSD into the M.2 slot at a slight angle. Push it in until it is fully seated.
7. **Secure SSD:** Press the SSD down towards the motherboard and secure it with the small screw provided with your motherboard or M.2 adapter.
8. **Close Case:** Reassemble your computer case and reconnect all power cables.

3.3. Software Configuration

9. **Boot System:** Power on your computer. You may need to enter your system's BIOS/UEFI settings (usually by pressing F2, Del, or F10 during startup) to ensure the M.2 slot is enabled and the SSD is recognized.
10. **Initialize Disk:** Once in the operating system, open Disk Management (Windows) or Disk Utility (macOS). The new SSD should appear as an unallocated disk. Initialize it as a GPT (GUID Partition Table) disk.
11. **Install NVMe Driver:** Install the Samsung NVMe driver you downloaded earlier. Follow the on-screen prompts.
12. **Verify Installation:** Check Device Manager (Windows) or System Information (macOS) to confirm that the Samsung 950 PRO SSD is recognized and functioning correctly.
13. **Partition and Format:** Create new partitions on the SSD as needed and format them.
14. **Migrate OS (Optional):** If you intend to use the 950 PRO as your boot drive, use Samsung Data Migration software to transfer your operating system and data from your old drive to the new SSD.



Figure 3: Samsung 950 PRO SSD detail

4. Operating Your SSD

The Samsung 950 PRO SSD operates as a high-speed storage device within your computer system. For optimal performance and management, Samsung provides dedicated software:

- **Samsung Magician Software:** This utility allows you to monitor the health and performance of your SSD, optimize its settings, update firmware, and enable features like RAPID Mode (if supported by your system). It provides valuable insights into your drive's status and helps maintain peak performance.
- **Samsung Data Migration Software:** Designed for easy and safe migration of your operating system, applications, and user data from an existing storage device to your new Samsung SSD. This ensures a smooth transition without the need for a fresh OS installation.

Both software tools are available for free download from the official Samsung website (www.samsung.com/ssd/download/tools/).

5. Maintenance and Care

To ensure the longevity and optimal performance of your Samsung 950 PRO SSD, consider the following maintenance tips:

- **Avoid Defragmentation:** Unlike traditional HDDs, SSDs do not benefit from defragmentation. It can actually reduce the lifespan of the drive. Ensure your operating system's defragmentation schedule is disabled for SSDs.
- **Maintain Free Space:** Keep a portion of your SSD's capacity free (e.g., 10-15%). This allows the drive's wear-leveling algorithms to function effectively, distributing writes evenly across all memory cells.
- **Ensure Proper Cooling:** While SSDs generate less heat than HDDs, high temperatures can still impact performance and lifespan. Ensure adequate airflow within your computer case, especially

around the M.2 slot.

- **Regular Firmware Updates:** Check for and install firmware updates for your SSD using the Samsung Magician software. Firmware updates often include performance improvements and bug fixes.
- **TRIM Command:** Ensure the TRIM command is enabled in your operating system. TRIM helps the SSD manage deleted data blocks, maintaining write performance over time. Modern operating systems typically enable this by default for SSDs.

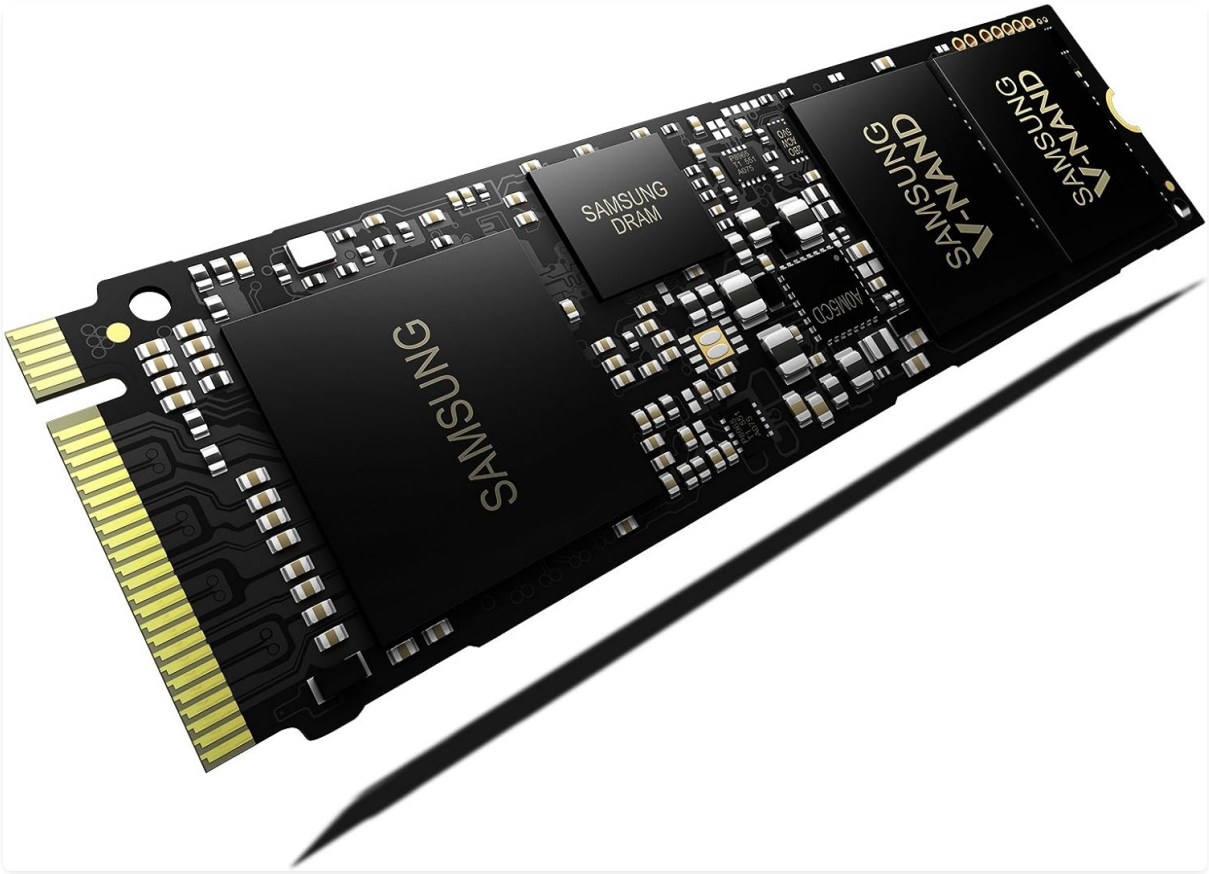


Figure 4: Internal view of Samsung V-NAND SSD components

6. Troubleshooting Common Issues

If you encounter issues with your Samsung 950 PRO SSD, refer to the following common problems and their potential solutions:

- **SSD Not Detected:**
  - Ensure the SSD is properly seated in the M.2 slot or PCIe adapter.
  - Check your motherboard's BIOS/UEFI settings to confirm the M.2 slot is enabled and configured correctly (e.g., PCIe mode).
  - Verify that your motherboard's chipset drivers are up to date.
  - Try a different M.2 slot or PCIe adapter if available.
- **Slow Performance:**
  - Ensure the Samsung NVMe driver is installed and up to date.
  - Run Samsung Magician software to check the drive's health and optimize settings.

- Verify that TRIM is enabled in your operating system.
- Check for background processes that might be heavily utilizing the drive.
- Ensure your system's power management settings are not throttling the SSD.

- **Operating System Fails to Boot from SSD:**
  - Confirm the boot order in your BIOS/UEFI settings prioritizes the Samsung 950 PRO SSD.
  - If you migrated your OS, ensure the migration process completed successfully and all boot partitions were transferred.
  - For Windows 7, ensure NVMe hotfixes are applied if not using the Samsung NVMe driver.

For further assistance, please visit the official Samsung support website or contact their customer service.

7. Technical Specifications

Below are the key technical specifications for the Samsung 950 PRO Series 512GB NVMe M.2 SSD:

Feature	Specification
Digital Storage Capacity	512 GB
Hard Disk Interface	NVMe (PCIe Gen. 3 x4)
Connectivity Technology	SATA (for compatibility, though NVMe is primary)
Brand	Samsung Electronics
Item Model Number	MZ-V5P512BW
Hardware Platform	PC
Item Weight	0.32 ounces
Product Dimensions (LxWxH)	3.16 x 0.09 x 0.87 inches
Color	Black
Flash Memory Size	512 GB
Sequential Read Speed	Up to 2,500 MB/s
Sequential Write Speed	Up to 1,500 MB/s
Random Read IOPS	Up to 300K
Random Write IOPS	Up to 110K

8. Warranty and Support

The Samsung 950 PRO Series SSD comes with a **5-Year Limited Warranty**, ensuring peace of mind regarding your investment. This warranty covers defects in materials and workmanship under normal use.

For detailed warranty information, technical support, driver downloads, and software utilities, please visit the official Samsung SSD support website:

www.samsung.com/ssd

You can also find additional resources and frequently asked questions on their support pages. When contacting support, please have your product model number (MZ-V5P512BW) and serial number ready.

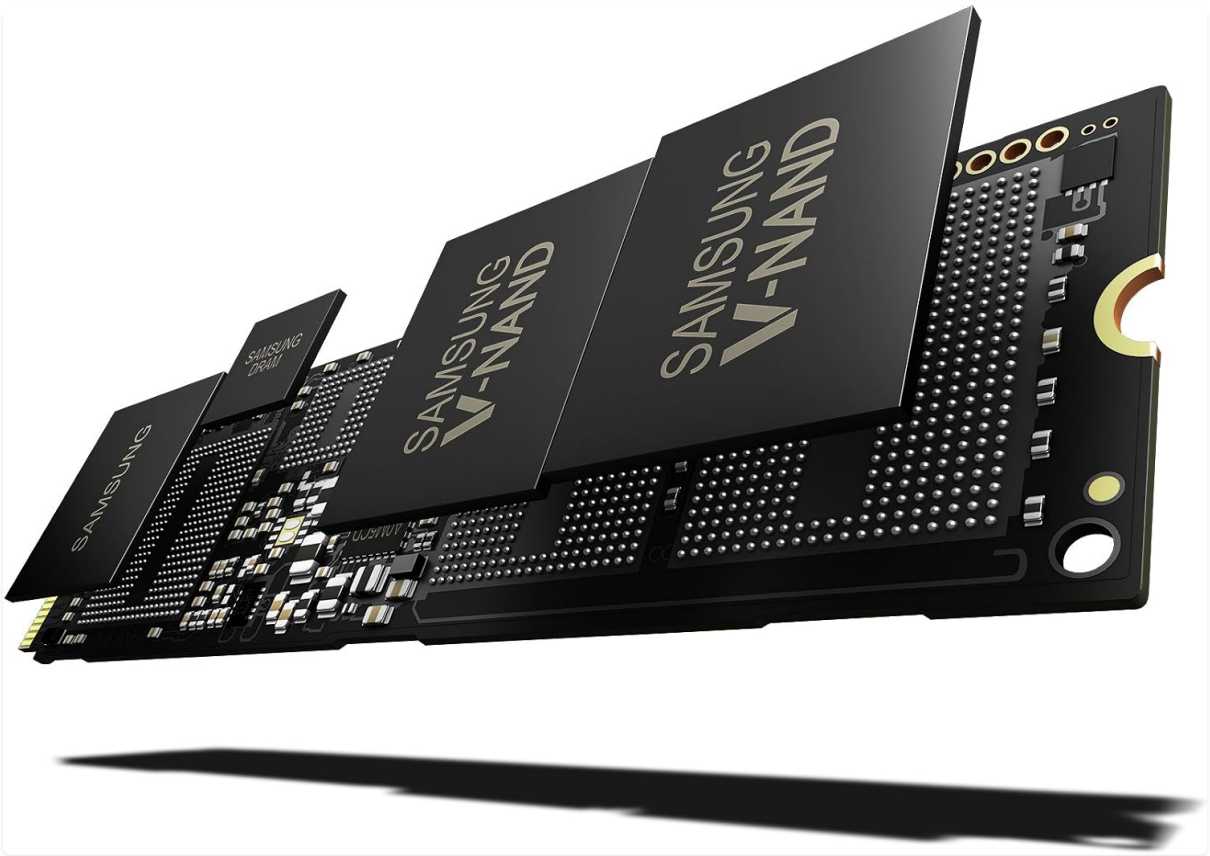


Figure 5: Samsung 950 PRO Series packaging highlighting warranty

For information related to document LA69-01586A, please refer to the official Samsung support portal or contact Samsung customer service.

© 2023 Samsung Electronics Co., Ltd. All rights reserved.
Samsung and 950 PRO are registered trademarks of Samsung Electronics Co., Ltd.